

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently Amended) A communication method for a noncontact RF ID system comprising:

communicating a data sequence having a first waveform which corresponds to one of codes "0" or "1" and which has a length of time T ;

communicating a data sequence having a second waveform which corresponds to the other of said codes "0" or "1" and which has a length of time T ; [[and]]

communicating a data sequence having a third waveform which corresponds to m (m is a natural number equal to or greater than 2) codes that are the same as the codes of the second waveform and where the third waveform has a length of time mT , wherein

the first waveform with 50% duty ratio is in a low level state at a starting point, is in a high level state at an end point and rises only at a position of $T/2$,

the second waveform with 50% duty ratio is in a high level state at a starting point, is in a low level state at an end point and rises only at a position of $T/2$, and

the third waveform with 50% duty ratio is in a high level state at a starting point, is in a low level state at an end point and rises only at a total of m positions of $T/2 + nT$ ($n=0, \dots, m-1$); and

replacing consecutive instances of the second waveform in the data sequence with the third waveform when the second waveform occurs consecutively in the data sequence.

2. (Currently Amended) A communication method for a noncontact RF ID system comprising:

communicating a data sequence having a first waveform which corresponds to one of codes "0" or "1" and which has a length of time T ;

communicating a data sequence having a second waveform which corresponds to one of codes "0" or "1" opposite to the first waveform and which has a length of time T ; [[and]]

communicating a data sequence having a third waveform which corresponds to m (m is a natural number equal to or greater than 2) codes that are the same as the codes of the second waveform and which has a length of time mT , wherein

the first waveform with 50% duty ratio is in a high level state at a starting point, is in a low level state at an end point and falls only at a position of $T/2$,

the second waveform with 50% duty ratio is in a low level state at a starting point, is in a high level state at an end point and falls only at a position of $T/2$, and

the third waveform with 50% duty ratio is in a low level state at a starting point, is in a high level state at an end point and falls only at a total of m positions of $T/2 + nT$ ($n=0, \dots, m-1$); and

replacing consecutive instances of the second waveform in the data sequence with the third waveform when the second waveform occurs consecutively in the data sequence.

3. (Cancelled)

4. (Previously Presented) A communication method for a noncontact RF ID system according to claim 1, wherein:

in the case in which the state transition is rising, the first waveform is a waveform that maintains a low level in a negative time direction for $T/2$ from the point in time that the waveform first rises, which is a center point of the waveform, and maintains a high level state for $T/2$ in a positive time direction from this center point;

the second waveform is a waveform that maintains a high level state in the positive time direction for t_1 from a point in time that the waveform first rises, which is the center point of the waveform, maintains a low level state for time t_2 until an end point of the waveform, maintains a low level state in the negative time direction for time t_1 from the center point of the waveform, and maintains a high level state for time t_2 until a starting point of the waveform (here, t denotes time, T denotes one cycle of the first and second waveforms, and $t_1 + t_2 = T/2$); and

the third waveform is a $C(2n)$ waveform which, in the case in which $m=2n$, maintains a high level state in the positive time direction for t_6 from the point in time that the waveform first rises; maintains a low level state in the negative time direction for t_3 from the point in time that the waveform first rises; maintains a high level state for time

t₄ until the starting point of the waveform; maintains a high level state in the positive time direction for $t\{2(n - k) + 6\}$ from the point in time that the waveform rises for the $(n + 1 - k)$ th time; maintains a low level state for $t\{2(n - k) + 3\}$ in the negative time direction from the point in time that the waveform rises for the $(n + 1 - k)$ th time; maintains a high level state in the positive time direction for $T/2$ from the point in time that the waveform rises for the n th time; maintains a low level state in the negative time direction for $t\{2(n - 1) + 3\}$ from the point in time that the waveform rises for the n th time; maintains a high level state in the positive time direction for $t\{2(n - 1) + 3\}$ from the point in time that the waveform rises for the $(n + 1)$ th time; maintains a low level state in the negative time direction for $T/2$ from the point in time that the waveform rises for the $(n + 1)$ th time; maintains a high level state in the positive time direction for $t\{2(n - k) + 3\}$ from the point in time that the waveform rises for the $(n + k)$ th time; maintains a low level state in the negative time direction for $t\{2(n - k) + 6\}$ from the point in time that the waveform rises for the $(n + k)$ th time; maintains a low level state in the negative time direction for t_6 from the point in time that the waveform rises the last time; maintains a high level state in the positive time direction for t_3 from the point in time that the waveform rises the last time; and maintains a low level state for time t_4 until an end point of the waveform, where n and k are natural numbers; $n \geq k \geq 1$; t is time; T is one cycle of the first and second waveforms; and $t_3 + t_4 = T/2$; $t\{2(n - k) + 5\} + t\{2(n - k) + 6\} = T$ (when n and $k \geq 2$); and

in the case in which $m = 2n + 1$, the third waveform is a $C(2n + 1)$ waveform that maintains a high level state in the positive time direction for t_6 from the point in time that the waveform first rises; maintains a low level state in the negative time direction for t_3

from the point in time that the waveform first rises; maintains a high level state for t_4 from the starting point of the waveform; maintains a high level state in the positive time direction for $t\{2(n-k)+6\}$ from the point in time that the waveform rises for the $(n+1-k)$ th time; maintains a low level state in the negative time direction for $t\{2(n-k)+3\}$ from the point in time that the waveform rises for the $(n+1-k)$ th time; maintains a high level state in the positive time direction for $t\{2(n-1)+5\}$ from the point in time that the waveform rises for the $(n+1)$ th time; maintains a low level state in the negative time direction for $t\{2(n-1)+5\}$ from the point in time that the waveform rises for the $(n+1)$ th time; maintains a high level state in the positive time direction for $t\{2(n-k)+3\}$ from the point in time that the waveform rises for the $(n+1+k)$ th time; maintains a low level state in the negative time direction for $t\{2(n-k)+6\}$ from the point in time that the waveform rises for the $(n+1+k)$ th time; maintains a low level state in the negative time direction for t_6 from the point in time that the waveform rises the last time; maintains a high level state in the positive time direction for time t_3 from the point in time that the waveform rises the last time; and maintains a low level state for t_4 until the end point of the waveform; (where n and k are natural numbers, $n \geq k \geq 1$, t is time, T is one cycle of the first and second waveforms, $t_3 + t_4 = T/2$, and $t\{2(n-k)+5\} + t\{2(n-k)+6\} = T$).

5. (Previously Presented) A communication method for a noncontact RF ID system according to 2, wherein:

in the case in which the state transition is a falling state transition, the first waveform is an inverted waveform that maintains a low level in a negative time direction for $T/2$ from the point in time that the waveform first rises, which is a center point of the

waveform, and maintains a high level state for $T/2$ in the positive time direction from this center point;

the second waveform is an inverted waveform that maintains a high level state in the positive time direction for t_1 from the point in time that the waveform first rises, which is the center point of the waveform, maintains a low level state for time t_2 until the end point of the waveform, maintains a low level state in the negative time direction for time t_1 from the center point of the waveform, and maintains a high level state for time t_2 until the starting point of the waveform (here, t denotes time, T denotes one cycle of the first and second waveforms, and $t_1 + t_2 = T/2$); and

the third waveform is an inverted $C(2n)$ waveform which, in the case in which $m=2n$, maintains a high level state in a positive time direction for t_6 from the point in time that the waveform first rises; maintains a low level state in the negative time direction for t_3 from the point in time that the waveform first rises; maintains a high level state for time t_4 until the starting point of the waveform; maintains a high level state in the positive time direction for $t\{2(n - k) + 6\}$ from the point in time that the waveform rises for the $(n + 1 - k)$ th time; maintains a low level state for $t\{2(n - k) + 3\}$ in the negative time direction from the point in time that the waveform rises for the $(n + 1 - k)$ th time; maintains a high level state in the positive time direction for $T/2$ from the point in time that the waveform rises for the n th time; maintains a low level state in the negative time direction for $t\{2(n - 1) + 3\}$ from the point in time that the waveform rises for the n th time; maintains a high level state in the positive time direction for $t\{2(n - 1) + 3\}$ from the point in time that the waveform rises for the $(n + 1)$ th time; maintains a low level state in the negative time direction for $T/2$ from the point in time that the waveform rises for the

$(n + 1)$ th time; maintains a high level state in the positive time direction for $t\{2(n - k) + 3\}$ from the point in time that the waveform rises for the $(n + k)$ th time; maintains a low level state in the negative time direction for $t\{2(n - k) + 6\}$ from the point in time that the waveform rises for the $(n + k)$ th time; maintains a low level state in the negative time direction for t_6 from the point in time that the waveform rises the last time; maintains a high level state in the positive time direction for t_3 from the point in time that the waveform rises the last time; and maintains a low level state for time t_4 until the end point of the waveform, where n and k are natural numbers; $n \geq k \geq 1$; t is time; T is one cycle of the first and second waveforms; and $t_3 + t_4 = T/2$; $t\{2(n - k) + 5\} + t\{2(n - k) + 6\} = T$ (when n and $k \geq 2$); and

in the case in which $m = 2n + 1$, the third waveform is an inverted $C(2n + 1)$ waveform that maintains a high level state in the positive time direction for t_6 from the point in time that the waveform first rises; maintains a low level state in the negative time direction for t_3 from the point in time that the waveform first rises; maintains a high level state for t_4 from the starting point of the waveform; maintains a high level state in the positive time direction for $t\{2(n - k) + 6\}$ from the point in time that the waveform rises for the $(n + 1 - k)$ th time; maintains a low level state in the negative time direction for $t\{2(n - k) + 3\}$ from the point in time that the waveform rises for the $(n + 1 - k)$ th time; maintains a high level state in the positive time direction for $t\{2(n - 1) + 5\}$ from the point in time that the waveform rises for the $(n + 1)$ th time; maintains a low level state in the negative time direction for $t\{2(n - 1) + 5\}$ from the point in time that the waveform rises for the $(n + 1)$ th time; maintains a high level state in the positive time direction for $t\{2(n - k) + 3\}$ from the point in time that the waveform rises for the $(n + 1 + k)$ th time; maintains

a low level state in the negative time direction for $t\{2(n - k) + 6\}$ from the point in time that the waveform rises for the $(n + 1 + k)$ th time; maintains a low level state in the negative time direction for t_6 from the point in time that the waveform rises the last time; maintains a high level state in the positive time direction for time t_3 from the point in time that the waveform rises the last time; and maintains a low level state for t_4 until the end point of the waveform; (where n and k are natural numbers, $n \geq k \geq 1$, t is time, T is one cycle of the first and second waveforms, $t_3 + t_4 = T/2$, and $t\{2(n - k) + 5\} + t\{2(n - k) + 6\} = T$).

6 – 13. (Cancelled)